

Applied Demography: Some Texas Examples

Texas State University
April 3, 2012
San Marcos, TX



Demography – the study of the size, distribution, and composition of populations; the processes determining these – namely, fertility, mortality, and migration; and the determinants and consequences of all of the above.

~ Bogue, 1968; Murdock & Ellis, 1991





Population Estimating Equation

$$P_1 = P_0 + B - D + I - O$$

where:

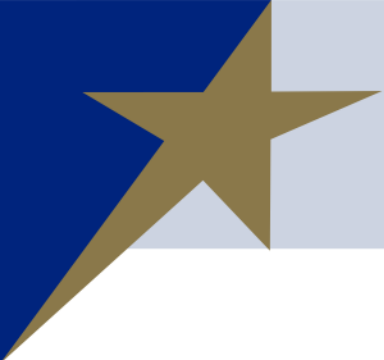
P_0 = the population at some earlier date

B = births

D = deaths

I = in-migration

O = out-migration



The Population Research Institute,
2.1 Kids: Stable Population
<http://youtu.be/zBS6f-JVvTY>

Mission

The Office of the State Demographer disseminates demographic and related socioeconomic data to the State of Texas and the general public. The State Demographer's Office monitors demographic and socioeconomic changes in the State in order to better inform the executive and legislative branches of Texas government. Special emphasis is placed on data that may be useful to policy makers in dealing with issues regarding the demand for state services.



Meeting the Mission

- Data Portal, Publications, and Reports
<http://txsdc.utsa.edu/>
- Population Estimates and Projections Program
<http://txsdc.utsa.edu/Data/TPEPP/Estimates/Index.aspx>
- Resource Witness at Legislative Hearings
- Public Presentations
<http://osd.state.tx.us>
- Data Requests
- Custom Research Projects
- Annual Conference for Data Users and Applied Demography Conference



Some Applied Demography Questions

- How many people lived in Texas in 2010? How does this compare to past population counts?
- Where are the largest concentrations of people located in the State of Texas?
- What race/ethnic group is growing the fastest?
- What percentage of the people living in Texas in 2010 were Hispanic?
- In what age groups are we seeing the largest growth?
- How many people own, rather than rent, their homes?

Use a blue or black pen.

Start here

The Census must count every person living in the United States on April 1, 2010.

Before you answer Question 1, count the people living in this house, apartment, or mobile home using our guidelines.

- Count all people, including babies, who live and sleep here most of the time.

The Census Bureau also conducts counts in institutions and other places, so:

- Do not count anyone living away either at college or in the Armed Forces.
- Do not count anyone in a nursing home, jail, prison, detention facility, etc., on April 1, 2010.
- Leave these people off your form, even if they will return to live here after they leave college, the nursing home, the military, jail, etc. Otherwise, they may be counted twice.

The Census must also include people without a permanent place to stay, so:

- If someone who has no permanent place to stay is staying here on April 1, 2010, count that person. Otherwise, he or she may be missed in the census.

1. How many people were living or staying in this house, apartment, or mobile home on April 1, 2010?

Number of people =

2. Were there any additional people staying here April 1, 2010 that you did not include in Question 1?

Mark ☒ all that apply.

- ☐ Children, such as newborn babies or foster children
- ☐ Relatives, such as adult children, cousins, or in-laws
- ☐ Nonrelatives, such as roommates or live-in baby sitters
- ☐ People staying here temporarily
- ☐ No additional people

3. Is this house, apartment, or mobile home — Mark ☒ ONE box.

- ☐ Owned by you or someone in this household with a mortgage or loan? *Include home equity loans.*
- ☐ Owned by you or someone in this household free and clear (without a mortgage or loan)?
- ☐ Rented?
- ☐ Occupied without payment of rent?

4. What is your telephone number? We may call if we don't understand an answer.

Area Code + Number

- -

OMB No. 0607-0919-C: Approval Expires 12/31/2011.

Form **D-61** (1-15-2009)

5. Please provide information for each person living here. Start with a person living here who owns or rents this house, apartment, or mobile home. If the owner or renter lives somewhere else, start with any adult living here. This will be Person 1.

What is Person 1's name? *Print name below.*

Last Name

First Name MI

6. What is Person 1's sex? Mark ☒ ONE box.

☐ Male ☐ Female

7. What is Person 1's age and what is Person 1's date of birth?

Please report babies as age 0 when the child is less than 1 year old.

Print numbers in boxes.

Age on April 1, 2010 Month Day Year of birth

→ NOTE: Please answer BOTH Question 8 about Hispanic origin and Question 9 about race. For this census, Hispanic origins are not races.

8. Is Person 1 of Hispanic, Latino, or Spanish origin?

- ☐ No, not of Hispanic, Latino, or Spanish origin
- ☐ Yes, Mexican, Mexican Am., Chicano
- ☐ Yes, Puerto Rican
- ☐ Yes, Cuban
- ☐ Yes, another Hispanic, Latino, or Spanish origin — *Print origin, for example, Argentinean, Colombian, Dominican, Nicaraguan, Salvadoran, Spaniard, and so on.* ☒

9. What is Person 1's race? Mark ☒ one or more boxes.

- ☐ White
- ☐ Black, African Am., or Negro
- ☐ American Indian or Alaska Native — *Print name of enrolled or principal tribe.* ☒

- ☐ Asian Indian ☐ Japanese ☐ Native Hawaiian
- ☐ Chinese ☐ Korean ☐ Guamanian or Chamorro
- ☐ Filipino ☐ Vietnamese ☐ Samoan
- ☐ Other Asian — *Print race, for example, Hmong, Laotian, Thai, Pakistani, Cambodian, and so on.* ☒
- ☐ Other Pacific Islander — *Print race, for example, Fijian, Tongan, and so on.* ☒

☐ Some other race — *Print race.* ☒

10. Does Person 1 sometimes live or stay somewhere else?

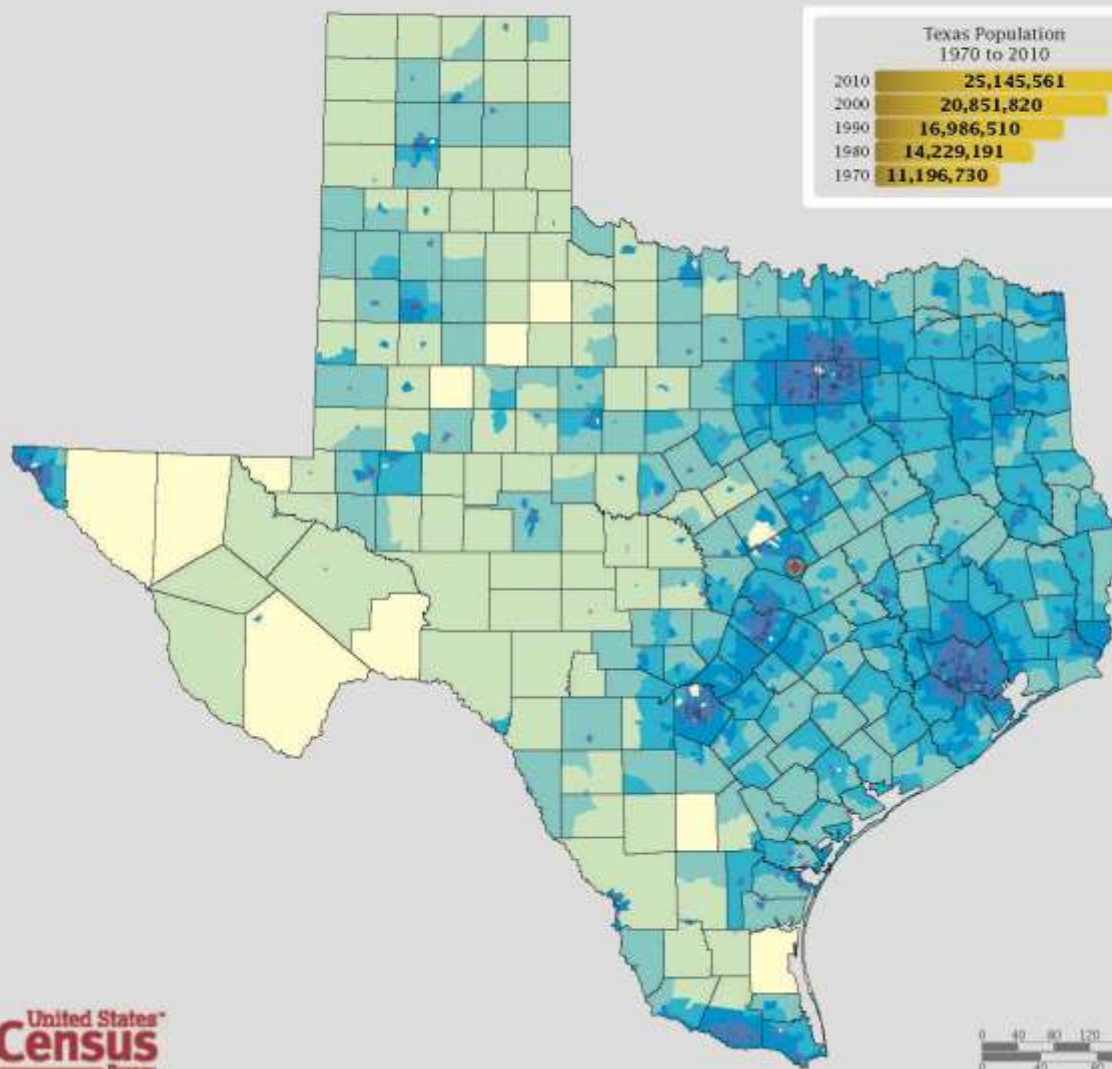
☐ No ☐ Yes — Mark ☒ all that apply.

- ☐ In college housing
- ☐ In the military
- ☐ At a seasonal or second residence
- ☐ For child custody
- ☐ In jail or prison
- ☐ In a nursing home
- ☐ For another reason

→ If more people were counted in Question 1, continue with Person 2.

2010 Census: Texas Profile

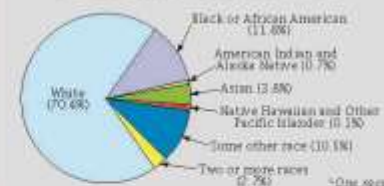
Population Density by Census Tract



Texas Population 1970 to 2010

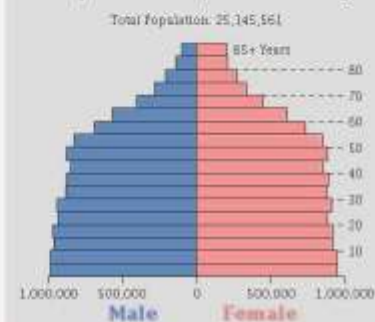
2010	25,145,561
2000	20,851,820
1990	16,986,510
1980	14,229,191
1970	11,196,730

State Race* Breakdown



Hispanic or Latino (of any race) makes up **37.6%** of the state population.

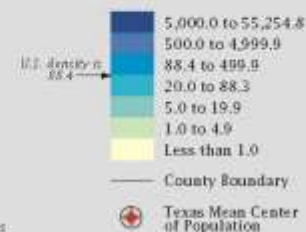
Population by Sex and Age



Housing Tenure



People per Square Mile by Census Tract





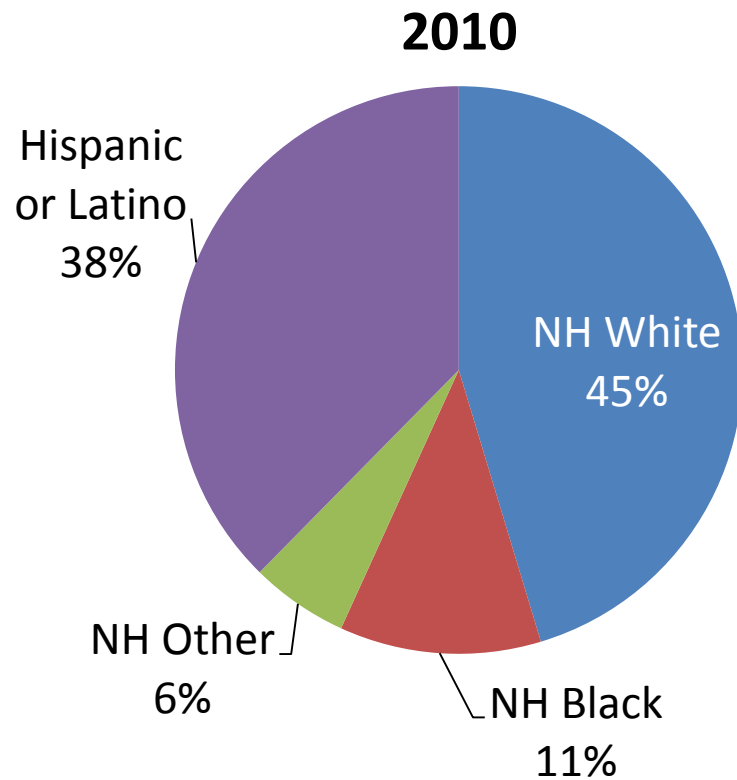
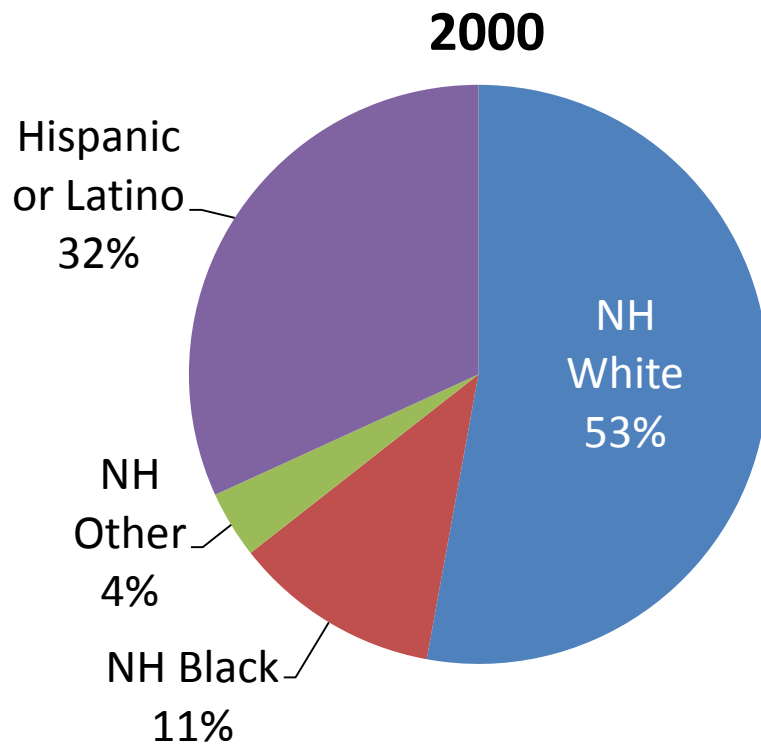
Growing States, 2000-2010

	2000 Population*	2010 Population*	Numerical Change 2000-2010	Percent Change 2000-2010
United States	281,421,906	308,745,538	27,323,632	9.7%
Texas	20,851,820	25,145,561	4,293,741	20.6%
California	33,871,648	37,253,956	3,382,308	10.0%
Florida	15,982,378	18,801,310	2,818,932	17.6%
Georgia	8,186,453	9,687,653	1,501,200	18.3%
North Carolina	8,049,313	9,535,483	1,486,170	18.5%
Arizona	5,130,632	6,392,017	1,261,385	24.6%

15.7% of numerical
change in U.S.

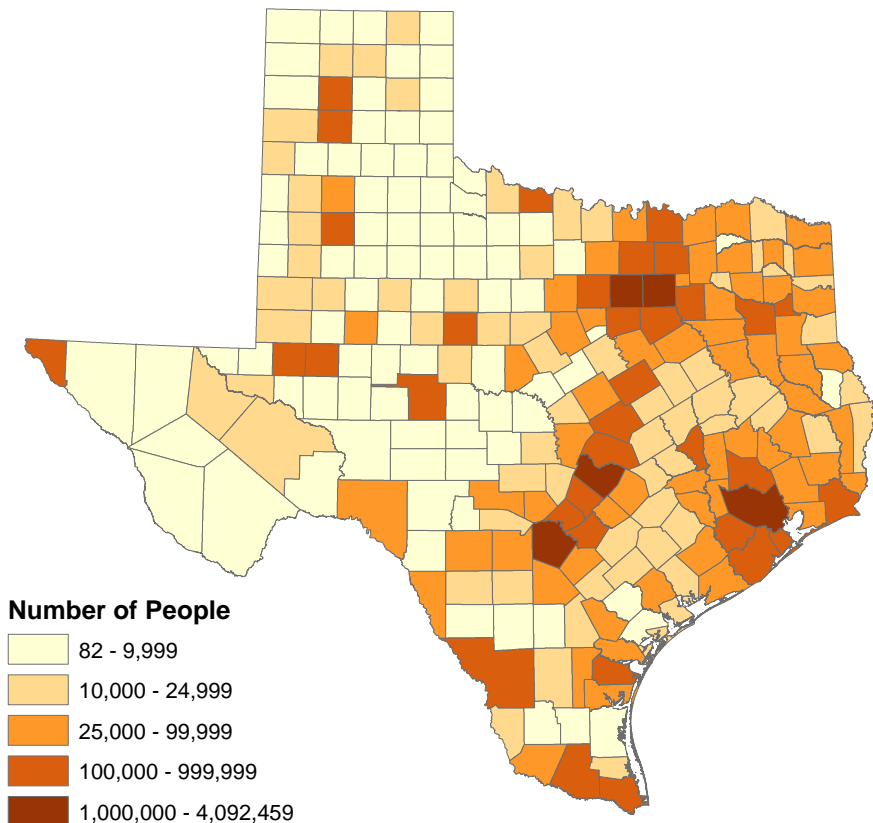
Note: Population values are decennial census counts for April 1, 2000 and April 1, 2010.
Source: U.S. Census Bureau. 2000 and 2010 Census Counts.

Texas Racial and Ethnic Composition, 2000 and 2010

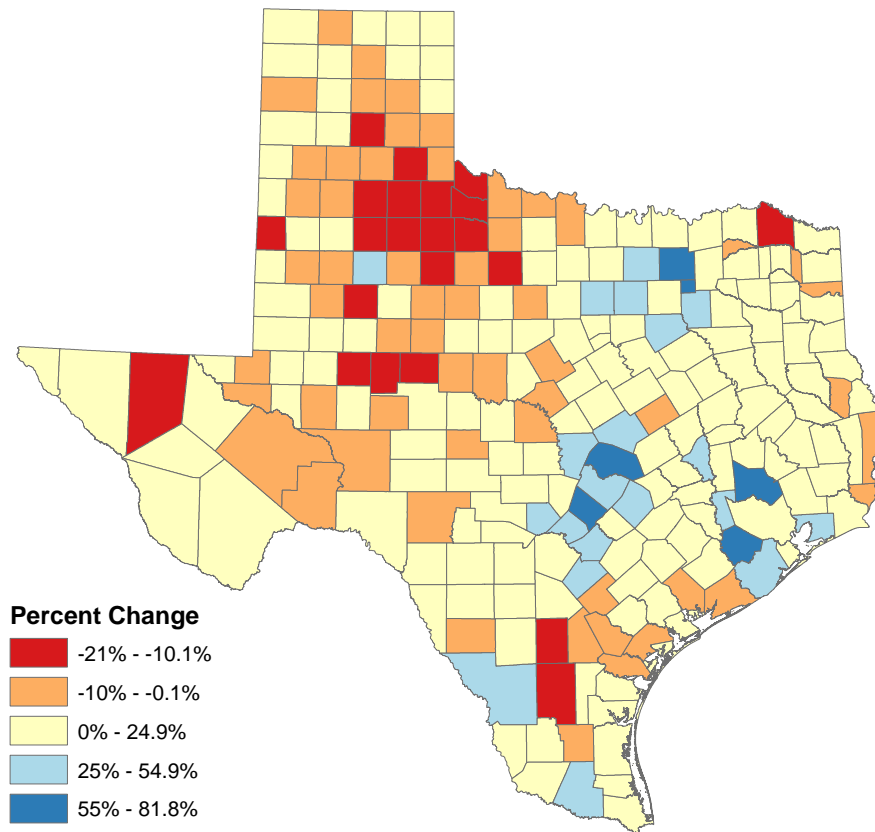


Total Population by County, 2010

Total Population

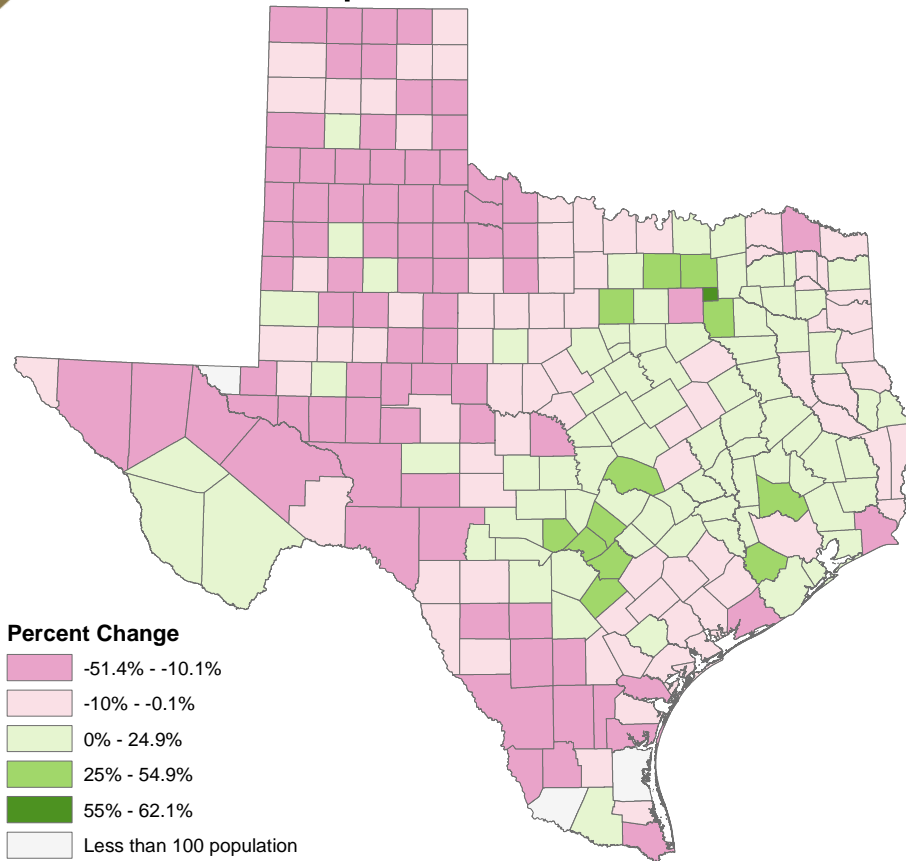


Population % Change, 2000 to 2010

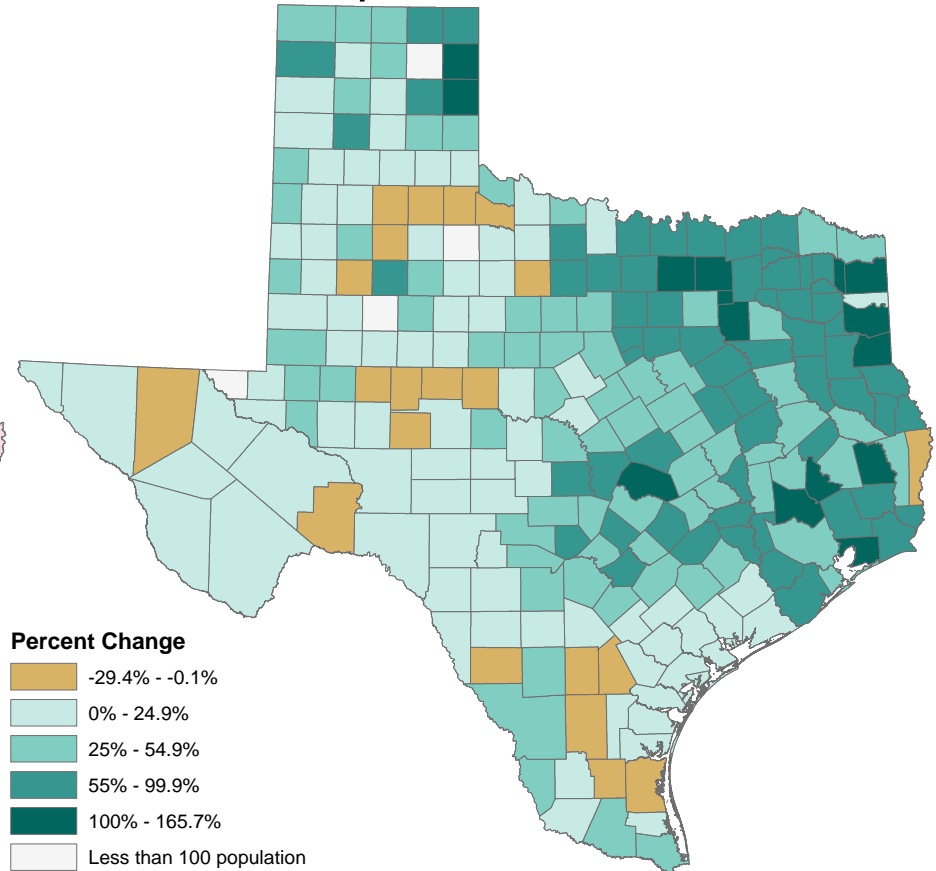


Percent Change in Population by County, 2000 to 2010

Non-Hispanic White

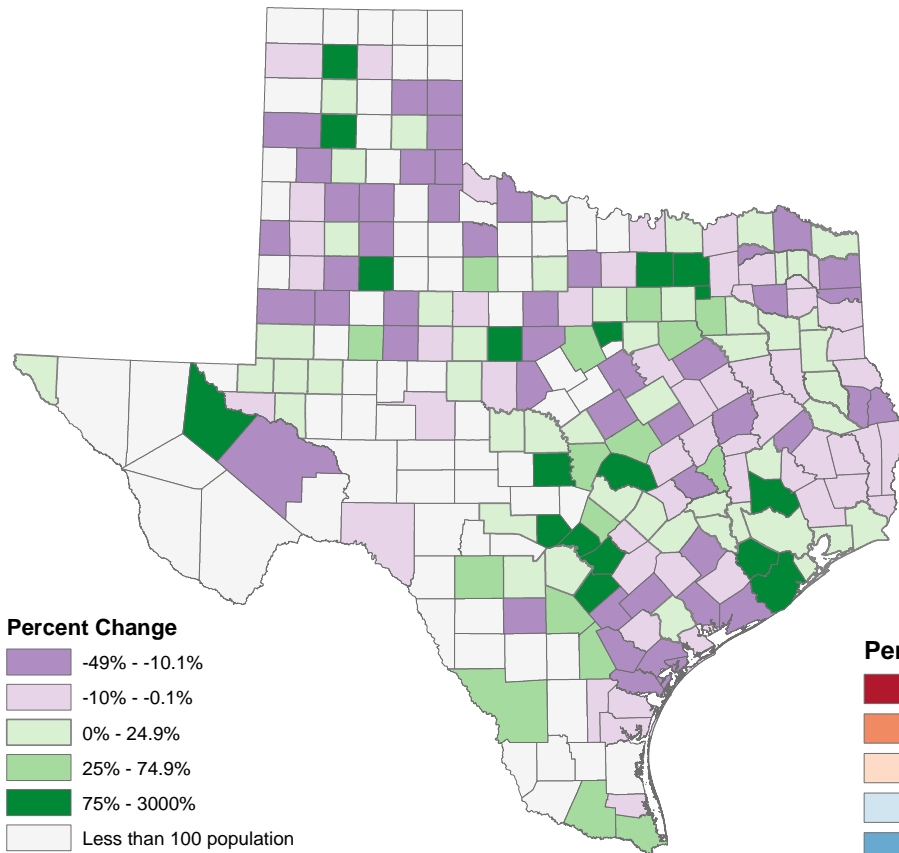


Hispanic

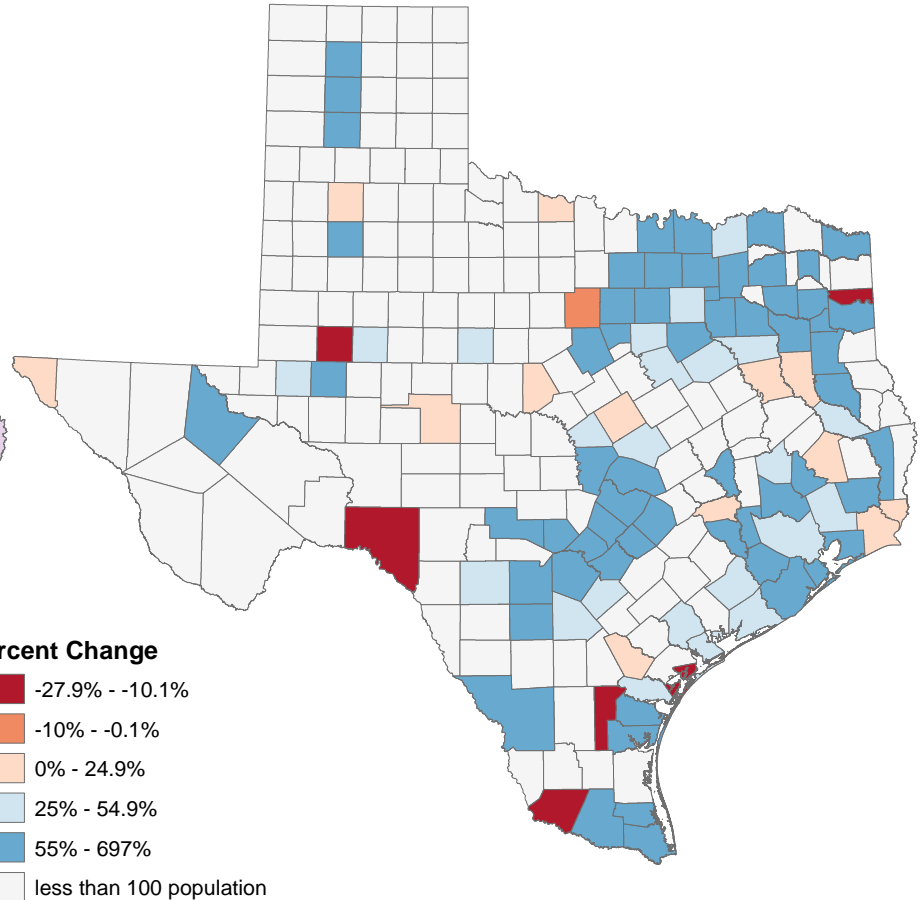


Percent Change in Population by County, 2000 to 2010

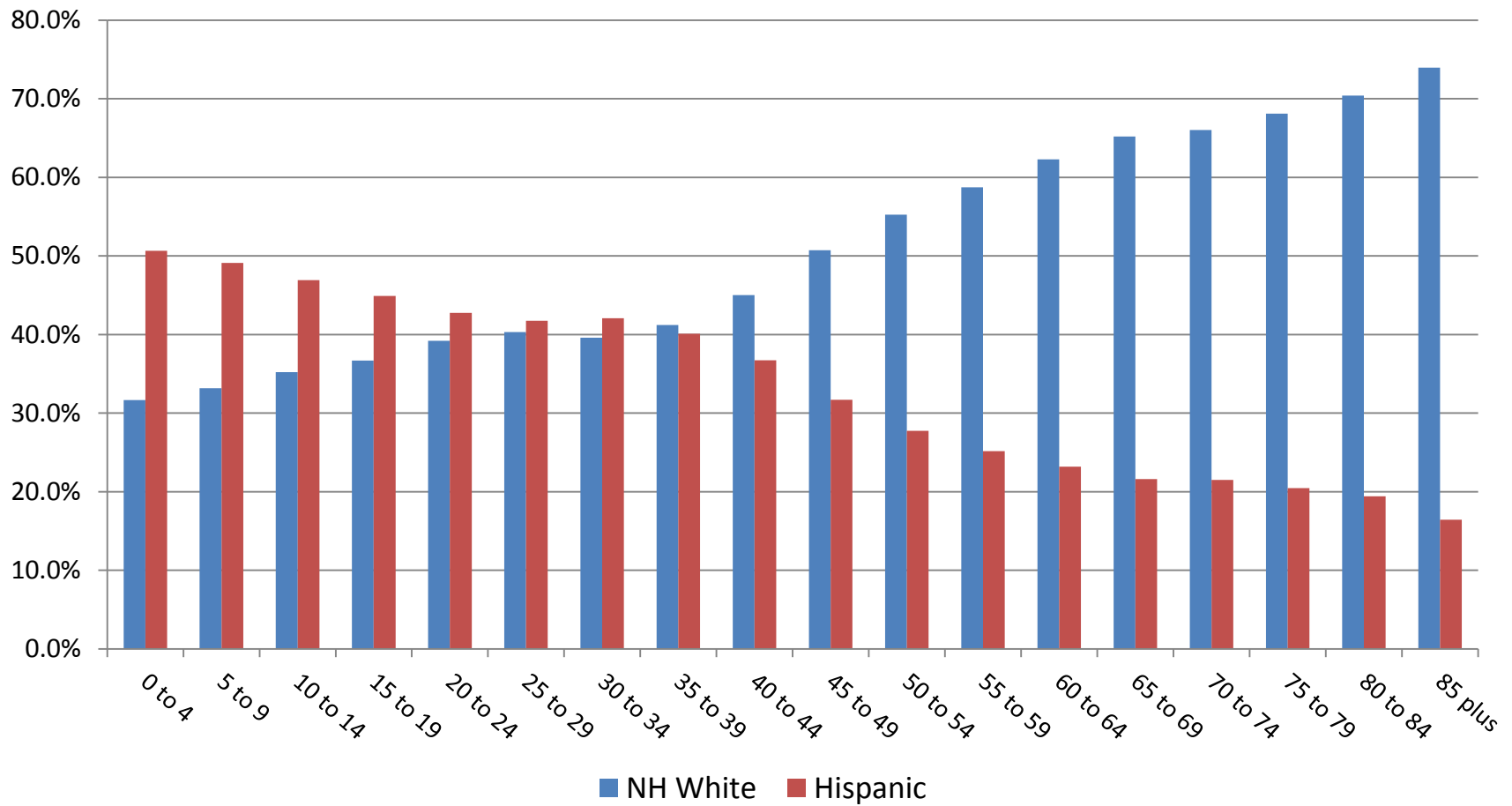
Non-Hispanic Black



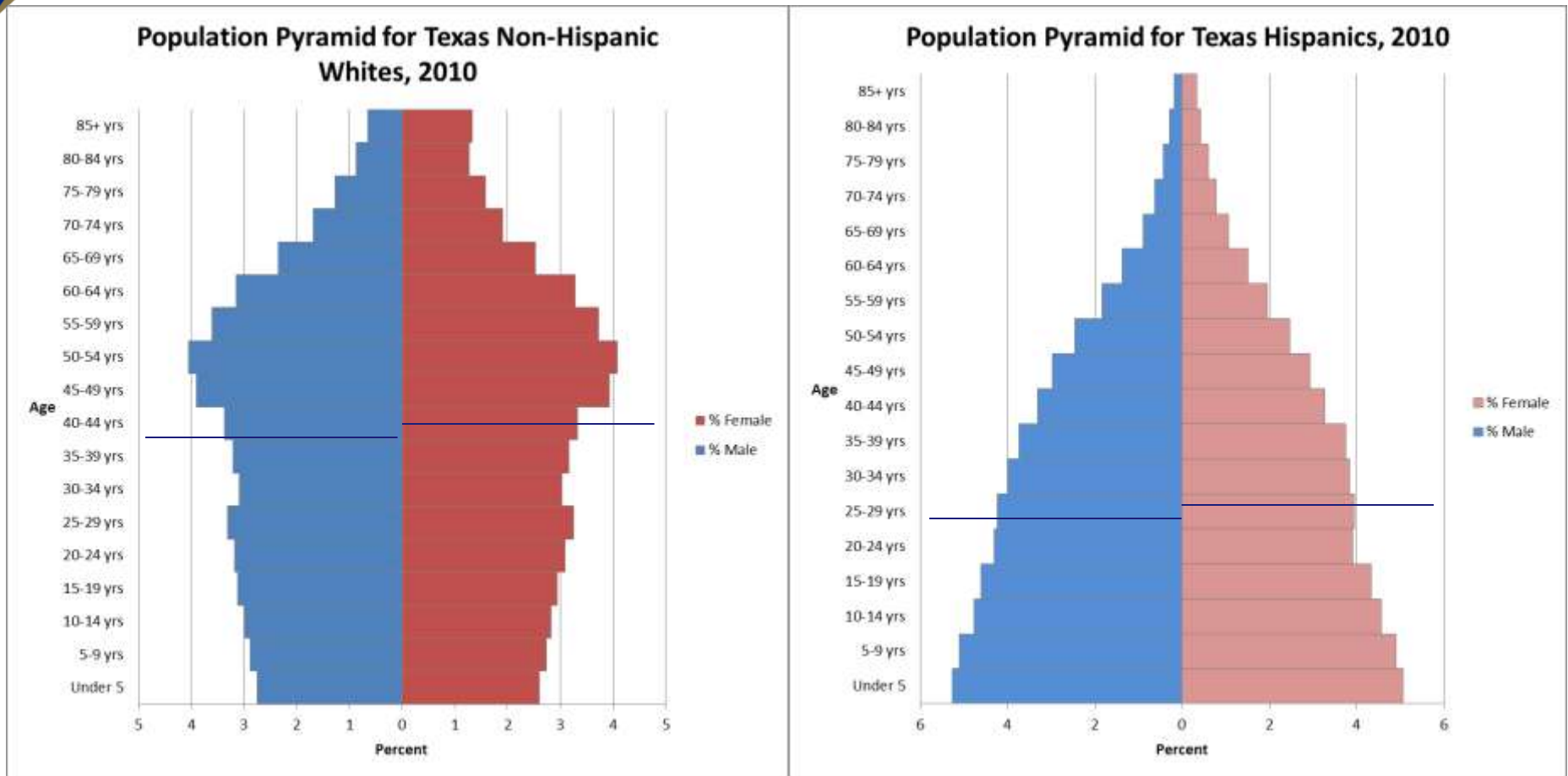
Non-Hispanic Asian



Percent of Texas Population by Age Group and Race/Ethnicity, 2010

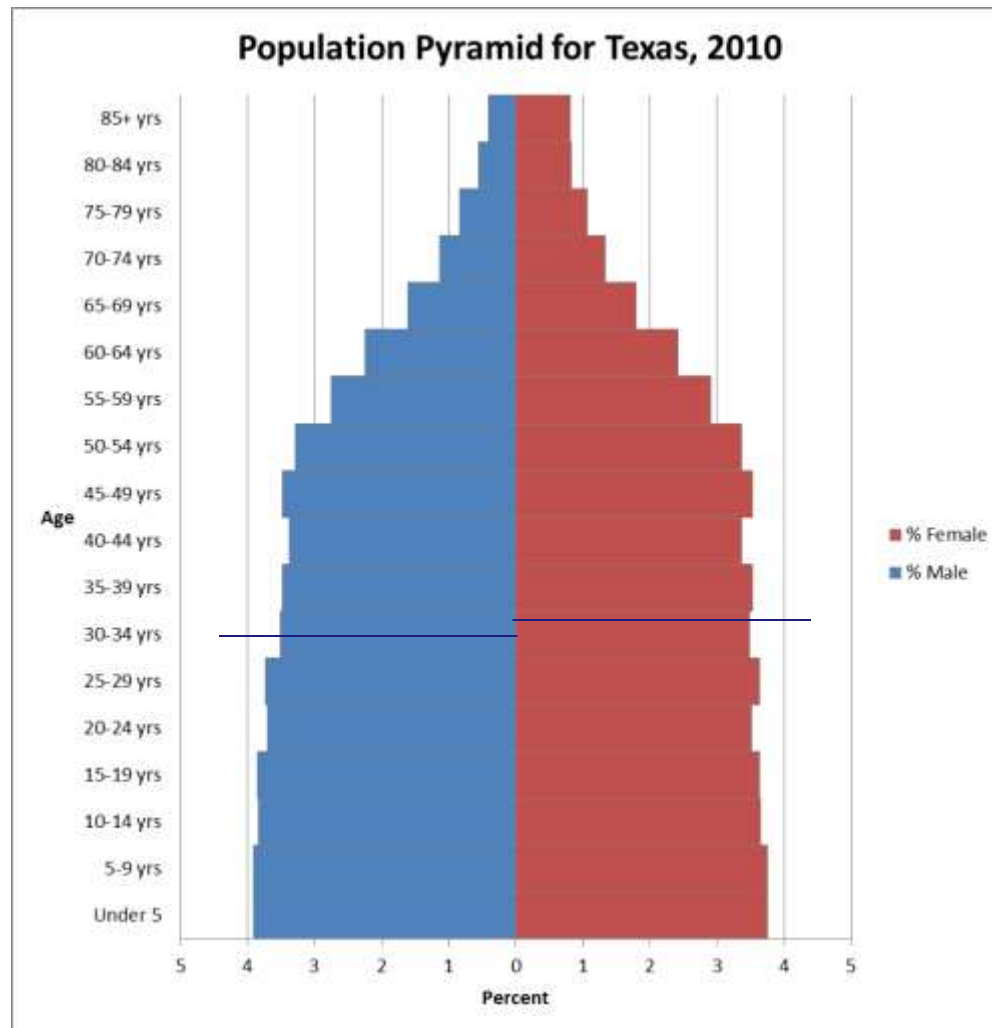


Texas Population Pyramids by Race/Ethnicity, 2010



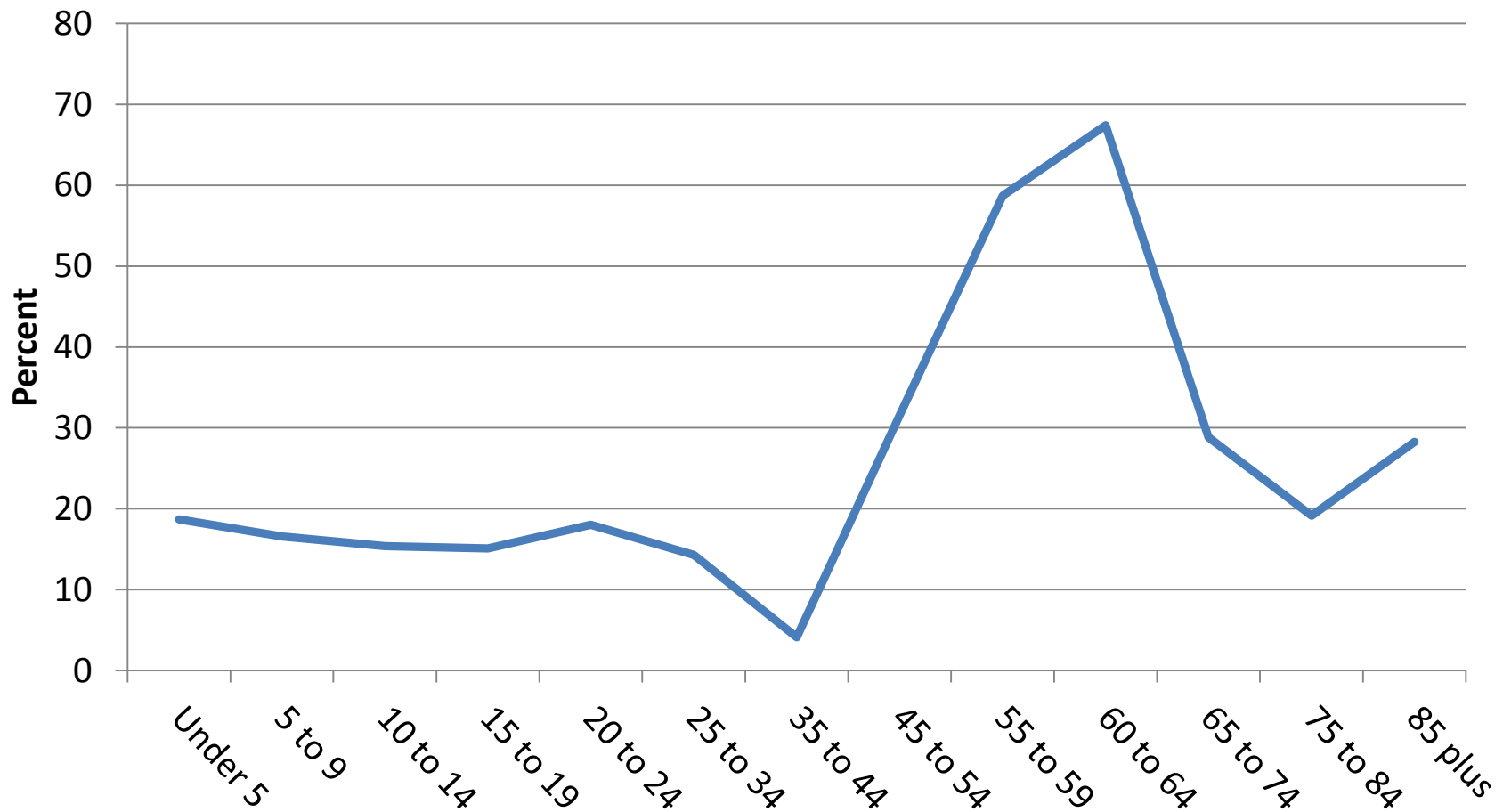
— Median age

Texas Population Pyramid, 2010



— Median age

Percent Change 2000 to 2010 by Age Group





More Common Applied Demography Questions

- Has racial/ethnic segregation decreased in Texas since the last Census?
- What demographic, socioeconomic, geospatial, and housing unit characteristics are related to household energy consumption? How do we use information about these relationships to target households and promote energy conservation?
- How many unauthorized immigrants can be found in Texas? What percentage of the population is made up of unauthorized immigrants? What is the geographic distribution of this population?

Assessing changes in racial/ethnic residential segregation in Texas counties



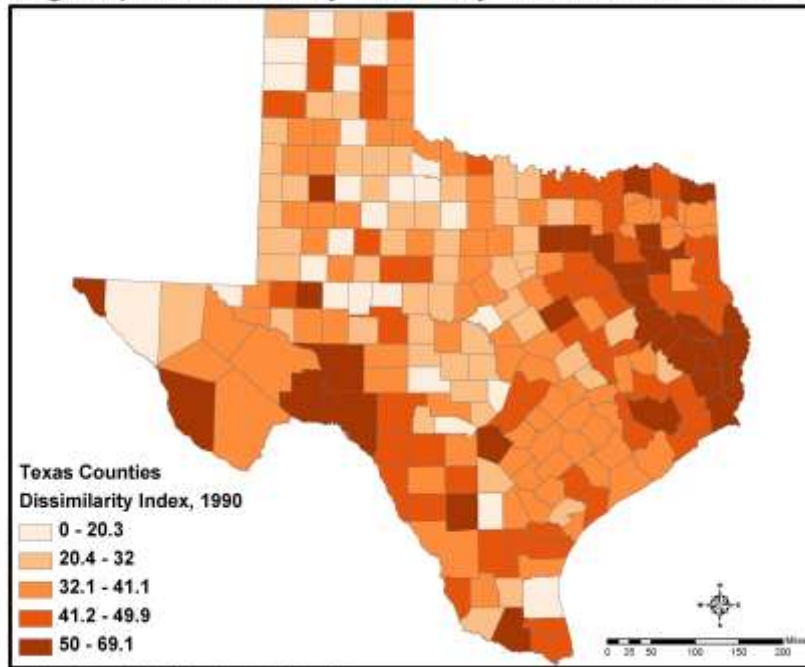


Data & Methods

- 1990, 2000, 2010 decennial census, summary file 1 data
- Segregation assessed from block group up to county
- Multi-group Dissimilarity Index
 - Hispanic, NH White, NH Black, NH Asian, & NH Other

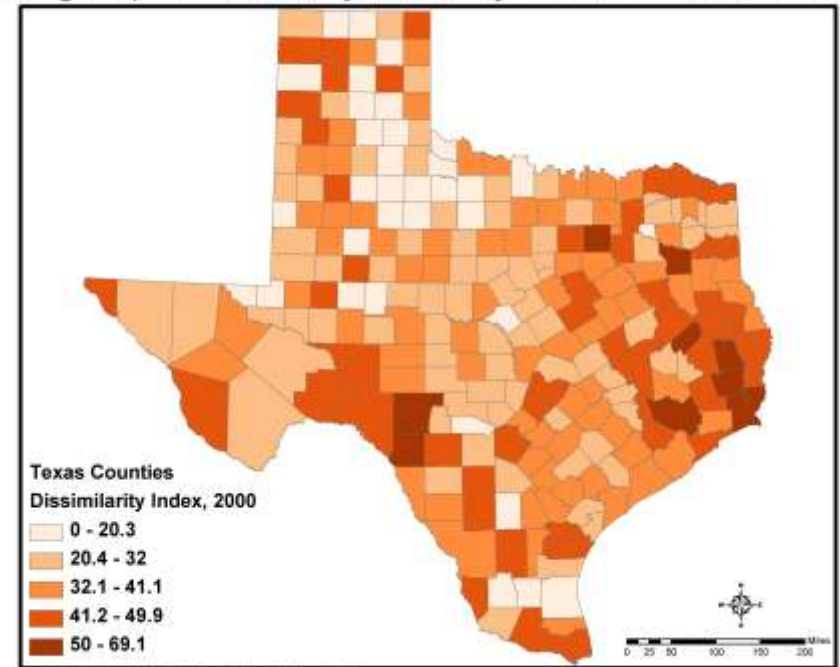
Findings

Multigroup Dissimilarity Index by Texas Counties, 1990



Coordinate System: NAD 1983 Texas Statewide Mapping System
Projection: Lambert Conformal Conic
Datum: North American 1983

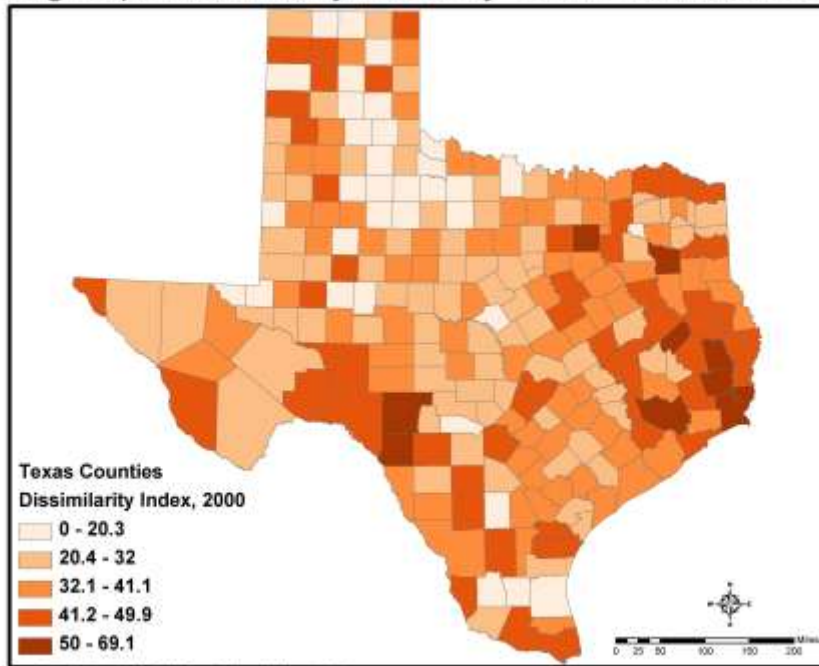
Multigroup Dissimilarity Index by Texas Counties, 2000



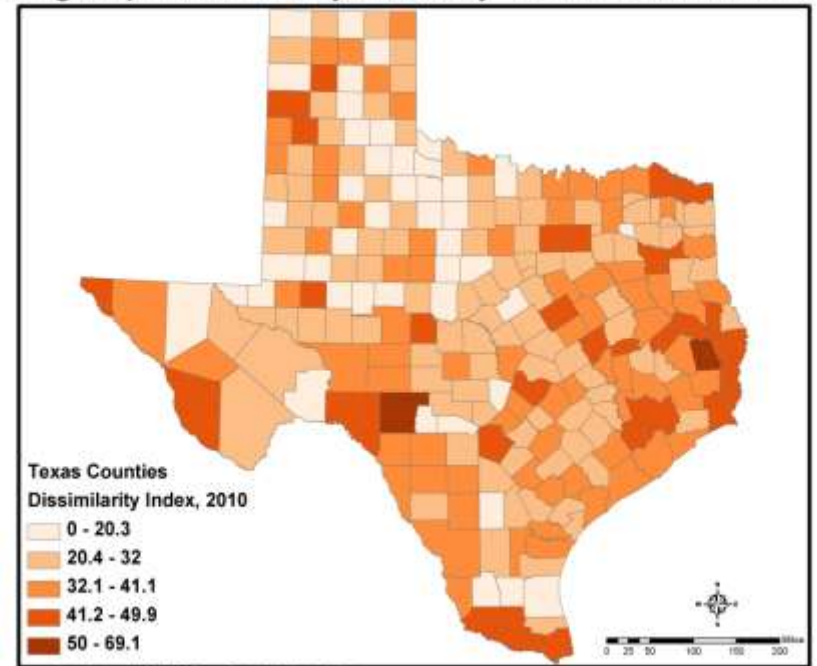
Coordinate System: NAD 1983 Texas Statewide Mapping System
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Datum: North American 1983

Findings

Multigroup Dissimilarity Index by Texas Counties, 2000

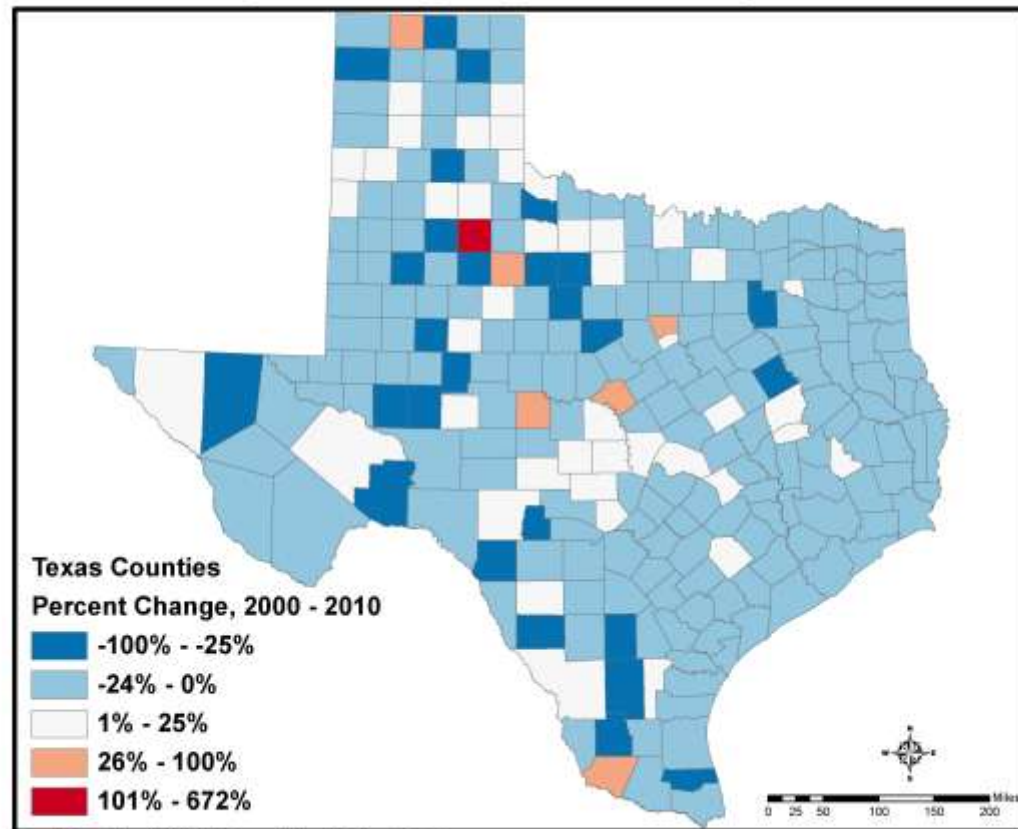


Multigroup Dissimilarity Index by Texas Counties, 2010



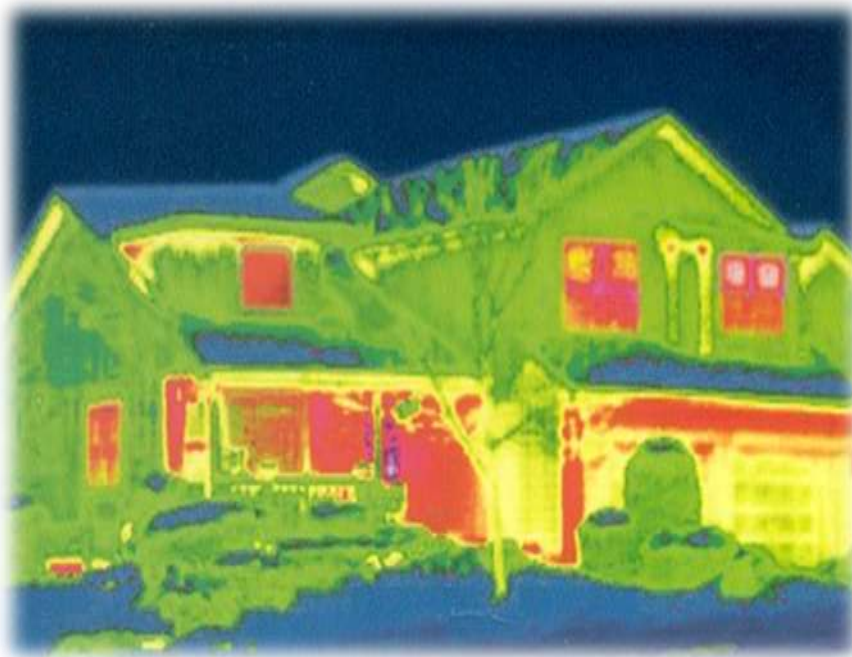
Findings

2000 - 2010 Change in Multigroup Dissimilarity for Texas Counties



Coordinate System: NAD 1983 Texas Statewide Mapping System
Projection: Lambert Conformal Conic
Datum: North American 1983

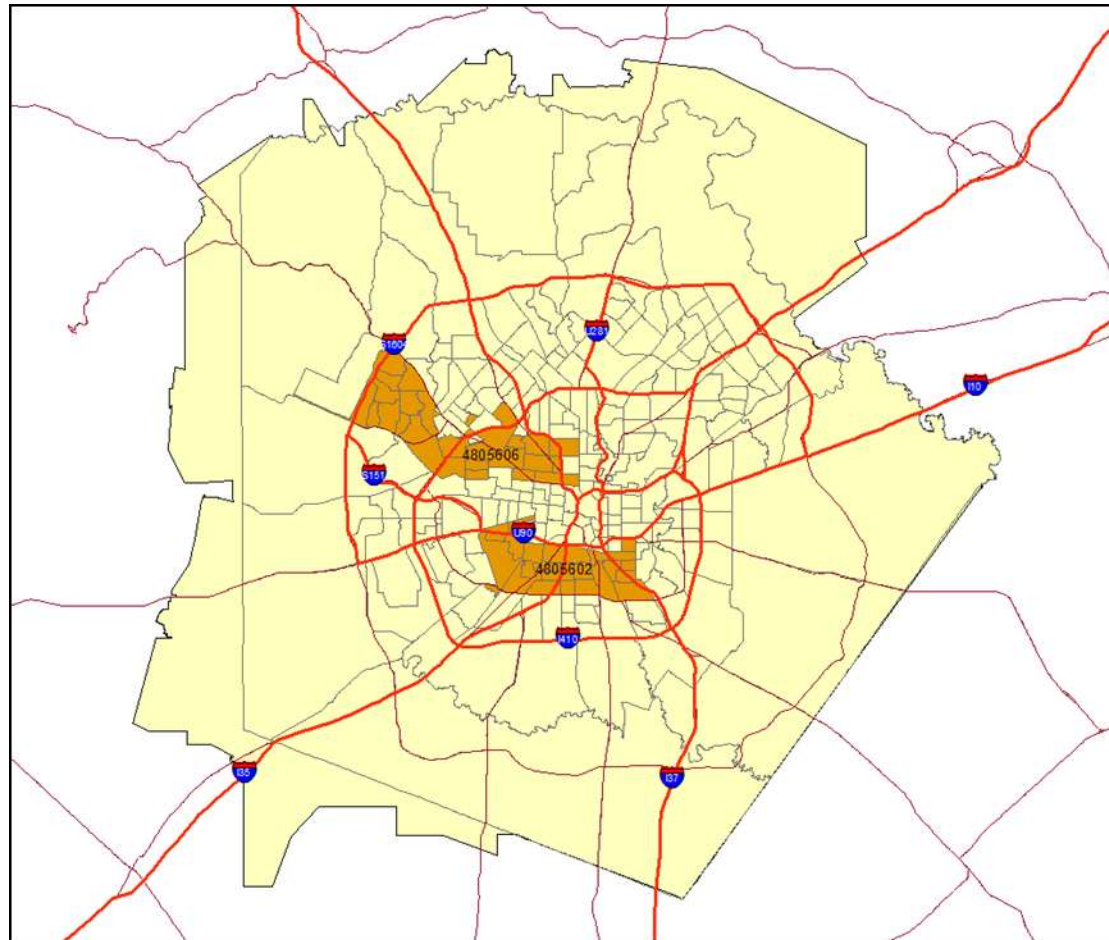
Identifying demographic, socioeconomic, geospatial, and housing unit characteristics that are related to household energy consumption





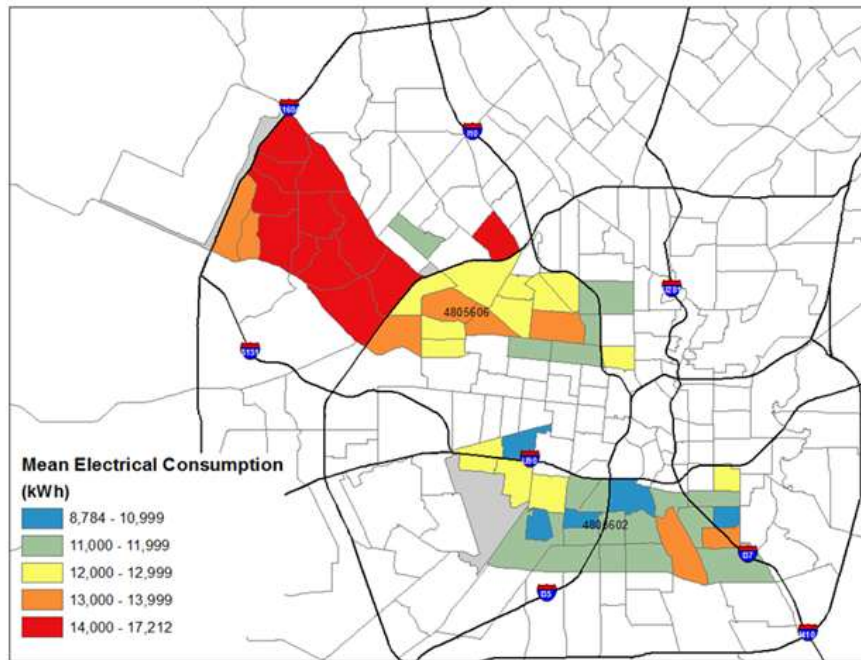
Data & Methods

- Data sources:
 - Energy provider consumption data
 - Census data
 - County appraisal district data
- Identified variables related to energy consumption
- Outlined analysis plan
- Addressing challenges with data

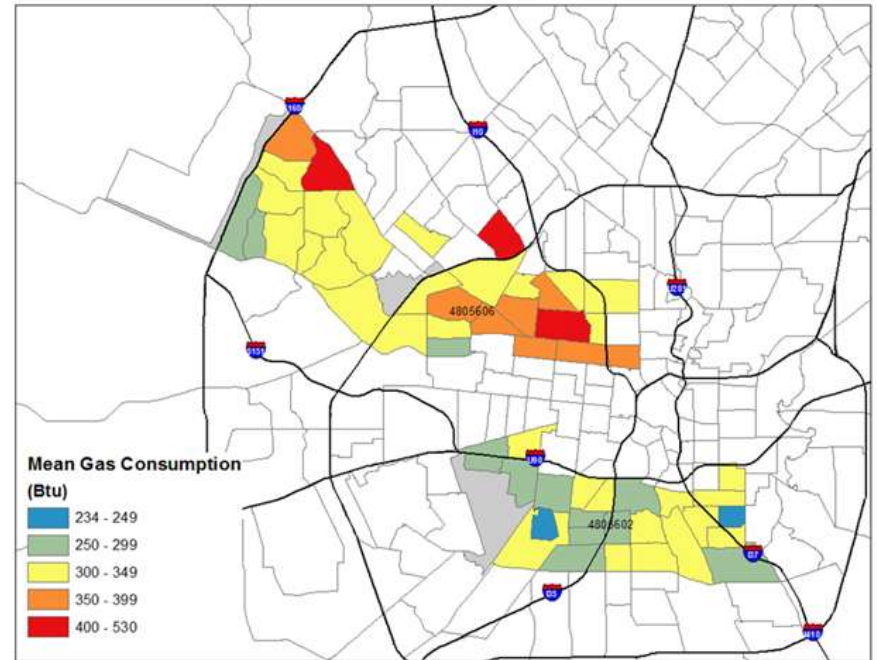


Dependent Variables

- Mean Electrical Consumption (kWhs)



- Mean Gas Consumption (BTUs)





Housing Characteristics

- Year built
- Square footage
- Number of rooms
- Number of stories
- Improvement characteristics
 - Presence of a pool
 - Installed siding



Demographic Variables

- Total population
- Total occupied housing units
 - Owner occupied
 - Renter occupied
- Percent Hispanic, non-Hispanic householders
- Mean age of householder
- Number of persons per household
- Family composition
- Educational attainment of householder
- Households with children under 6
- Households with seniors
- Median household income



Behavioral Characteristics

- Participated in rebate program
- Installed a smart thermostat

Estimating the number of unauthorized immigrants in the State





Residual Method

Estimates of total foreign born population

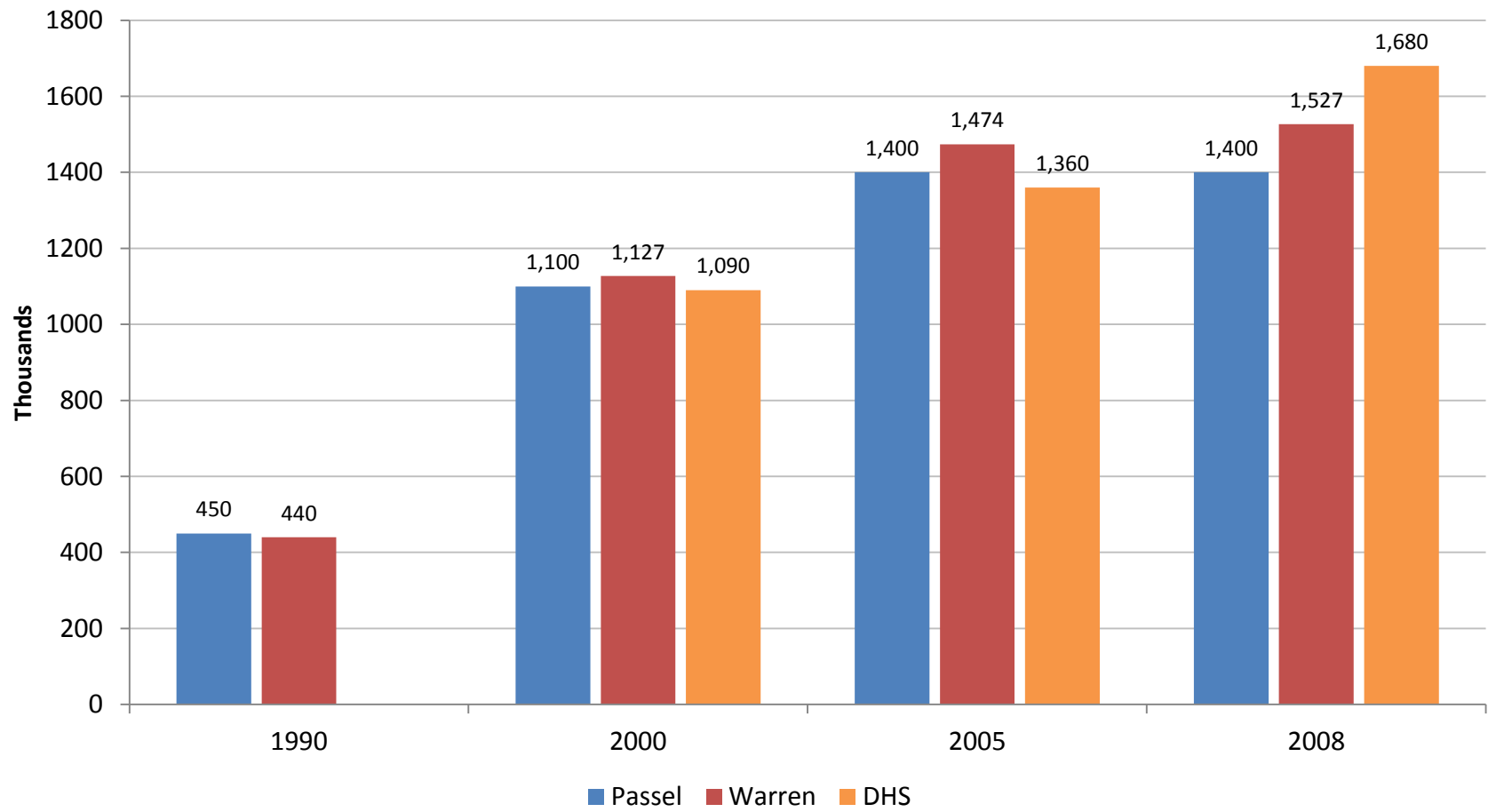
–

Estimates of legal foreign born residents

=

Unauthorized immigrant population

Estimates of the Texas Unauthorized Immigrant Population





Data & Methods

- Individual Taxpayer Identification Number data from the IRS
- Regression analysis used to estimate proportion of ITINs and state estimate by controlling for parameters related to the unauthorized status
 - $(\text{ITIN/State Estimate})_{ts} = X_{ts}\alpha + W_{ts}\beta + Z_{ts}\gamma + \varepsilon_{ts}$

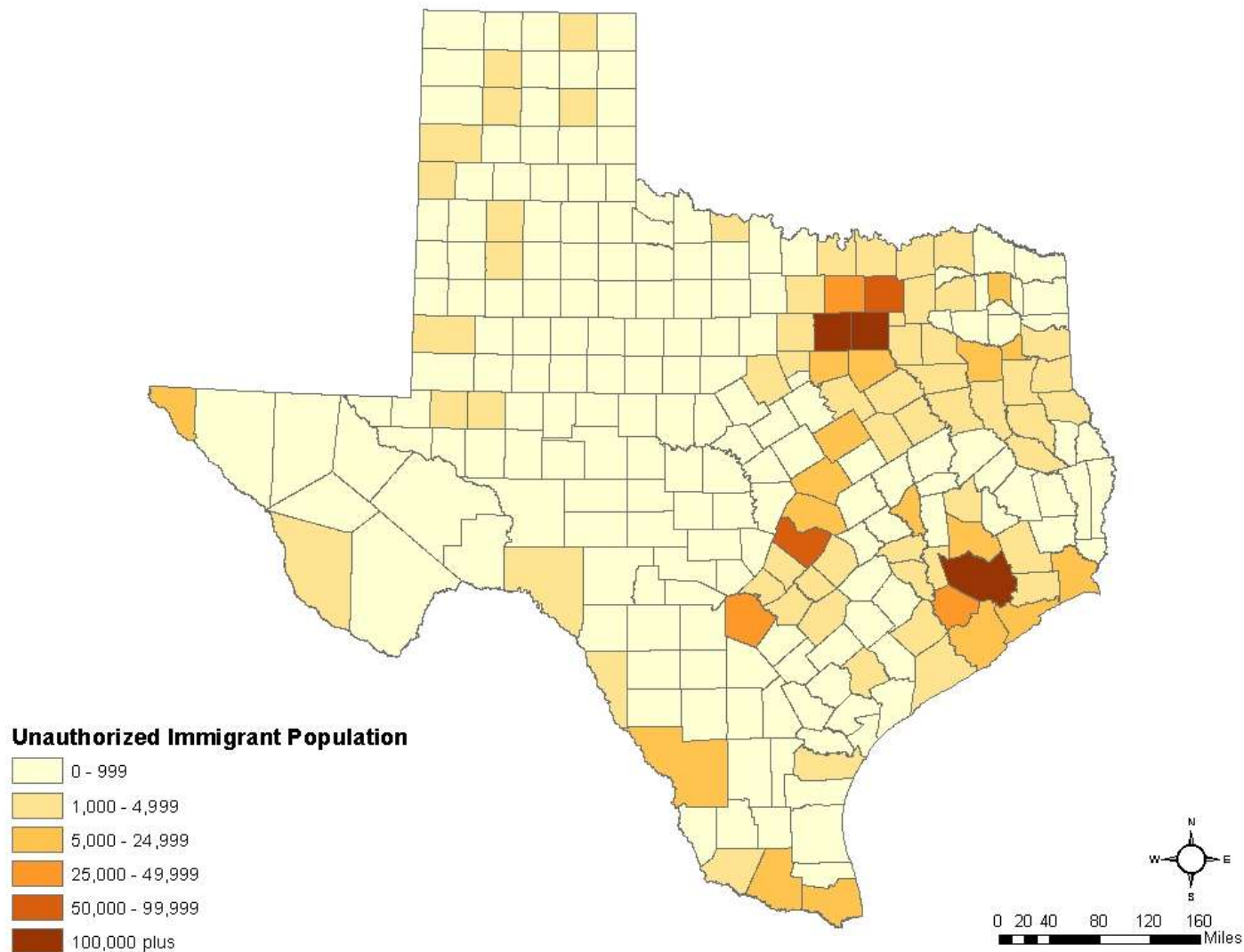


Data & Methods

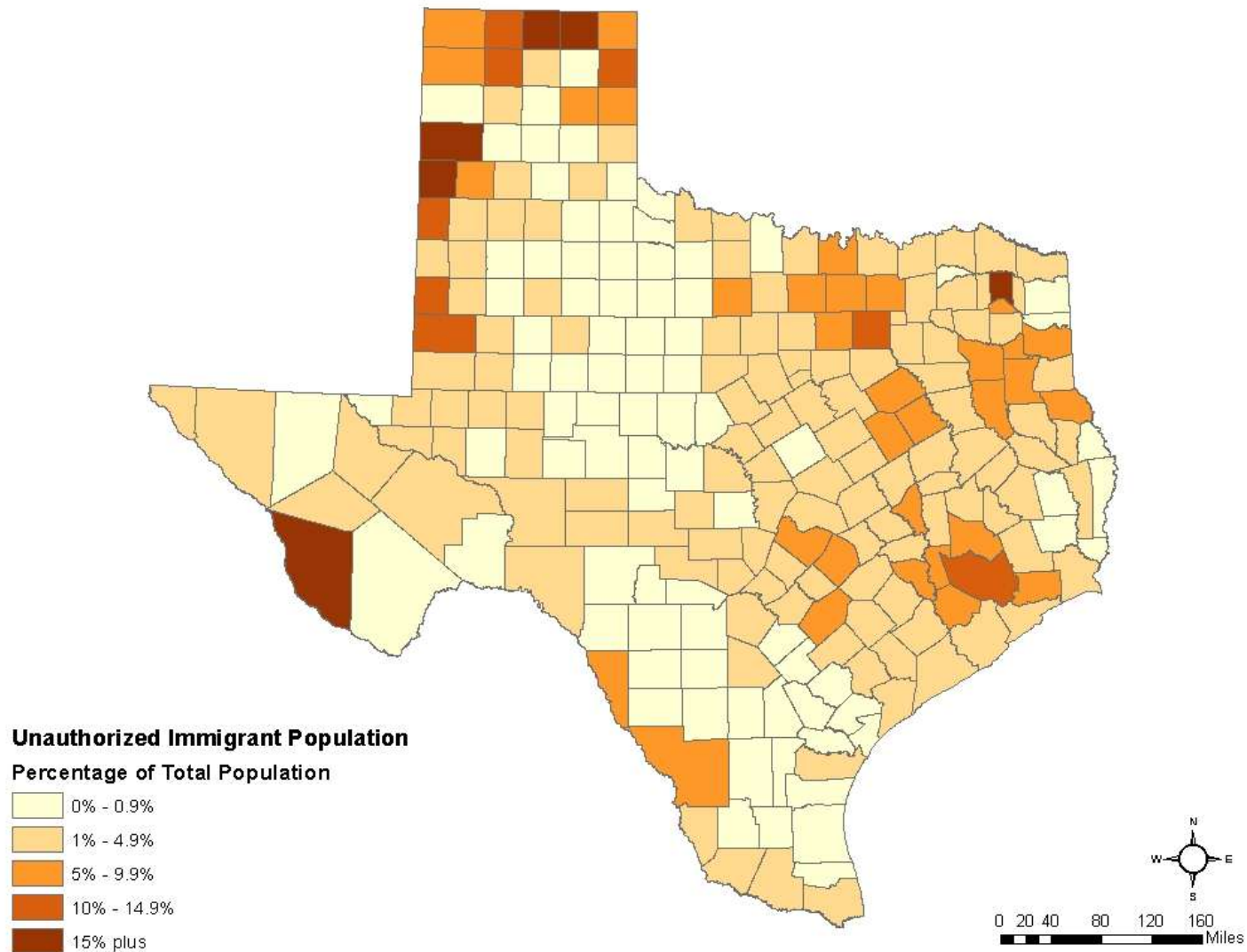
- Final Model:

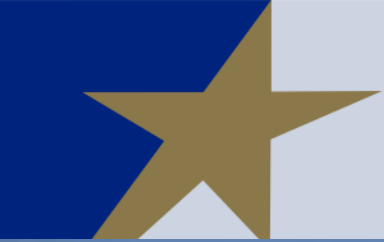
	2008 Statewide Model	
R squared	0.6828	
	Coeff.	p-value
Demographic Characteristics		
% Age 18 plus	-0.02084	0.014
Born in Central America	-0.0123	0.003
Employment Characteristics		
Manufacturing Employment	0.036524	0.000
% Not in labor force	-0.01598	0.000
Tax Filing Characteristics		
% New returns	0.074203	0.000
Constant	0.233072	0.332

Estimates of the Unauthorized Immigrant Population, 2008



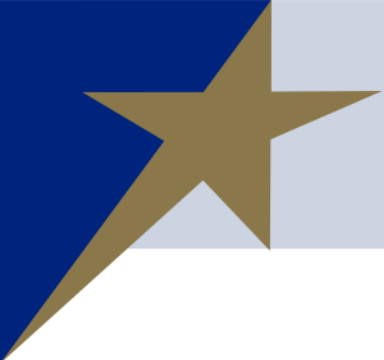
Estimates of the Unauthorized Immigrant Population, 2008





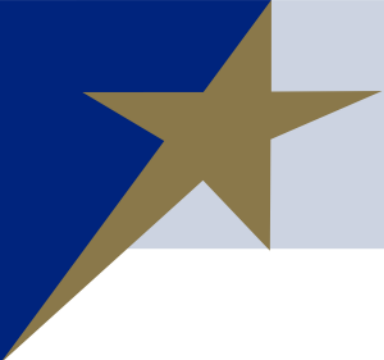
Demographics & Destiny





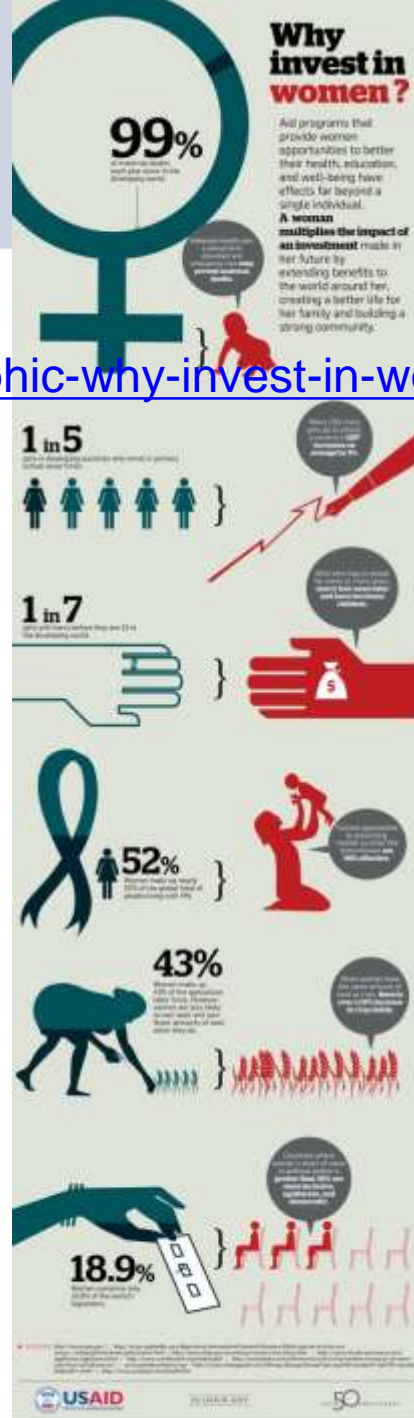
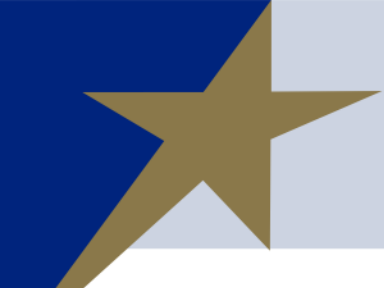
Hans Rosling's The Joy of Stats BBC Four

<http://youtu.be/jbkSRLYSojo>



The U.S. in a converging world, Hans Rosling on Fareed Zakaria GPS

<http://www.youtube.com/watch?v=WjVHvC9EeB4&feature=related>



<http://50.usaid.gov/infographic-why-invest-in-women/usaid-women/?size=original>

UTSA Ph.D. in Applied Demography

Dr. Johnelle Sparks

Graduate Advisor of Record

Office: (210) 458-3163

E-mail: Johnelle.Sparks@utsa.edu

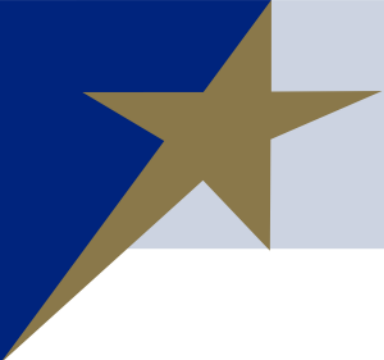
Website: <http://copp.utsa.edu/demography/home>

Office of the State Demographer

Office: (512) 463-8390 or (210) 458-6530

E-mail: State.Demographer@osd.state.tx.us

Website: <http://osd.state.tx.us>



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